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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,721	02/02/2006	Kazuhiro Shiomi	062079	9201
38834 7590 11/27/2009 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036				
EXAMINER				
KRUPICKA, ADAM C				
ART UNIT		PAPER NUMBER		
1794				
NOTIFICATION DATE		DELIVERY MODE		
11/27/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

# Office Action Summary

**Application No.**

10/566,721

**Applicant(s)**

SHIOMI ET AL.

**Examiner**

Adam C. Krupicka

**Art Unit**

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 September 2009.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 4-19 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1 and 4-19 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 02 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB/06)  
Paper No(s)/Mail Date 08/17/2009  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### **Examiner's Note**

The amended claims and remarks filed September 22, 2009 are acknowledged, claims 1 and 4-19 are pending, claims 2 and 3 have been cancelled.

### ***Claim Objections***

**Claims 11 and 12** are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. In light of applicants' amendments to the claims filed September 22, 2009 claims 11 and 12 do not have the effect of further limiting parent claim 10. With respect to claim 11, it is noted that claim 10 already requires a tin content of at least 1 mass % and with respect to claim 12 it is noted that claims 10 already requires a tin content of not more than 13 mass %.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 4-12 and 14-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda *et al.* (JP H11-284111 A) in view of Strom *et al.* (US Pat. 3,761,256).

**Regarding applicants' claims 1, 6, 7 and 8**, Ueda *et al.* teach a heat sink member comprising a layer of molybdenum (*figure 10*) having a layer of copper disposed on both sides (*figure 10 #12 and #13*) with a layer of brazing material located between the molybdenum layer and each of the copper layers (*figure 10 #14 and #15*). *See also paragraph 10*. Ueda *et al.* do not appear to explicitly teach a brazing layer of between 1 and 13 mass % Sn. However Strom *et al.* teach Sn-Cu brazing material with a Sn content from 5-35% (*col. 4 lines 22-37*) useful in the brazing of a copper material. It would have been obvious for one of ordinary skill in the art at the time of the invention to use a known Sn-Cu brazing composition, such as the one disclosed by Strom *et al.*, as the brazing material in the composite structure of Ueda *et al.* because it is known conventional, and effective alloy for brazing, especially in use with a copper base material. *See col. 4 lines 22-37*.

With regards to the overlapping range of Strom *et al.* with the present claims it is noted that the Strom *et al.* teach a tin content which significantly overlaps the tin content as presently claimed. Absent evidence, with respect to the claims, that a tin content of 1 to 13% is critical, the present claims are not considered to be patentably distinct from the heat sink member of Ueda *et al.* with the brazing alloy of Strom *et al.*

Additionally, it is noted that Ueda *et al.* teach the heat sink as fixed to a semiconductor (*paragraph 0008*), where the examiner considers a semiconductor fixed to a heat sink to have a region corresponding to a region on the semiconductor.

**Regarding applicants' claim 4**, although Ueda *et al.* do not disclose formation of the molybdenum layer by sintering, it is noted that “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process”, *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Further, “although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product”, *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 298, 292 (Fed Cir. 1983). See MPEP 2113.

**Regarding applicants' claims 5 and 9**, one of ordinary skill in the art at the time of the invention would have found it obvious to adjust the thickness of the copper and molybdenum layers to achieve the best heat transfer and dissipation, while minimizing the materials required. Further because both applicants' and Ueda *et al.* are forming heat sinks from similar materials it would be expected that the optimum thickness for the copper and molybdenum layers achieved by one of ordinary skill in the art is consistent with those taught, and claimed by applicants'.

**Regarding applicants' claims 10-12 and 14-19**, Ueda *et al.* teach a heat sink member as shown above where the layers are joined by positioning the brazing material between the layers and then melting the brazing material (*figure 10 and paragraph 0031*).

**Claims 4 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda *et al.* in view of Strom *et al.*, as applied to claims 1 and 10 above, further in view of Sakata *et al.* (PGPub US 2001/0008703).

Ueda *et al.* and Strom *et al.* teach the formation of a heat sink member as shown above, but do not appear to explicitly disclose the method for forming the molybdenum layer, however Sakata *et al.* teach a heat sink body constructed from a sintered compact of molybdenum (*paragraphs 0060 and 0061*). It would have been obvious for one of ordinary skill in the art at the time of the invention to form the molybdenum layer of Ueda *et al.* by sintering in order to produce a molybdenum layer that is low in porosity, high in strength and that is excellent in heat dispersion ability (*paragraph 0154*).

#### ***Response to Amendment***

In light of applicants' amended claims filed September 22, 2009 the objection to the claims for including references to figures is withdrawn.

Additionally, in light of applicants' amendment filed September 22, 2009 the rejection of **claims 1, 2, 10, 11, and 16** under 35 U.S.C. 102(b) as being anticipated by Soga *et al.* (WO 02/49797) is withdrawn.

The rejections made in combination with Jin *et al.*, as applied to claims 1-19, have been withdrawn. Claims 1, and 4-19 are now rejected in combination with Strom *et al.* in light of applicants amended claims requiring that the tin content be between 1 and 13 mass %.

***Response to Arguments***

Applicants' arguments with respect to *Ueda et al.* in view of *Jin et al.* and *Udea et al.* in view of *Jin et al.* in view of *Sakata et al.* are moot in view of the new grounds of rejection as presented above.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam C. Krupicka whose telephone number is (571)270-7086. The examiner can normally be reached on Monday - Thursday 7:30am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Adam C Krupicka/  
Examiner, Art Unit 1794

/Jennifer McNeil/  
Supervisory Patent Examiner, Art Unit 1794